

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference IPD/P1128/WOD	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/ GB 95/ 00629	International filing date (<i>day/month/year</i>) 22/03/1995	Priority date (<i>day/month/year</i>) 23/03/1994
International Patent Classification (IPC) or national classification and IPC C12N15/53		
Applicant THE SECRETARY OF STATE FOR DEFENCE et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

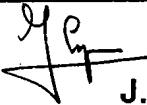
2. This REPORT consists of a total of 4 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consists of a total of _____ sheets.

3. This report contains indications and corresponding pages relating to the following items:

- I Basis of the report
- II Priority
- III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

Date of submission of the demand 23/10/1995	Date of completion of this report 12.07.96
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

I. Basis of the report

1. This report has been drawn up on the basis of (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*)

the international application as originally filed

the description, pages , as originally filed

pages , filed with the demand

pages , filed with the letter of

the claims, Nos. , as originally filed

Nos. , as amended under Article 19

Nos. , filed with the demand

Nos. , filed with the letter of

the drawings, sheets / fig. , as originally filed

sheets / fig. , filed with the demand

sheets / fig. , filed with the letter of

2. The amendments have resulted in the cancellation of:

the description, pages:

the claims, Nos.

the drawings, sheets / fig.

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2 (c)).

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Claims	1-21,23-25	YES
	Claims	22	NO
Inventive Step	Claims	1-21,23-25	YES
	Claims	22	NO
Industrial Applicability	Claims	1-25	YES
	Claims		NO

2. Citations and Explanations

1). The present international application relates to a firefly luciferase variant having a glutamate replaced by an other amino acid. Said glutamate is found at residue 354 of *Photinus pyralis* luciferase or at residue 356 of *Luciola mingrellica*, *Luciola cruciata* and *Luciola lateralis*. Luciferases having such an amino acid substitution possess increased heat stability over wild type luciferases.

2). Document D1 (EP-A-0 524 448) discloses a thermostable luciferase of a firefly, wherein an amino acid at the 217-position of the wild-type amino acid sequence is converted into a hydrophobic amino acid. After heating of said luciferase at 50°C for 60 min 65 to 70% of the residual enzyme activity is kept (D1, p. 13).

The features given in claim 22 of the present international application are not sufficient to distinguish the claimed luciferase from those described in D1.

In consequence, claim 22 does not meet the requirements of Art. 33 (2) PCT.

3). Having regard to the available prior art, the claimed subject-matter of claims 1-21, and 23-23 is novel (Art. 33 (2) PCT) and also involves an inventive step since it could not be deduced in an obvious manner from the prior art (Art. 33 (3) PCT).

D1 describes an amino acid substitution at residue 217 of a firefly luciferase, however an amino acid substitution at residue 354 (*Photinus*) or 356 (*Luciola*) is neither described nor suggested in this document.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

In order to meet the requirements of Rule 6 PCT, the claimed matter should be defined by true technical and positive features.

Claims 1-4 do not meet this requirement, since the amino acid residue to be replaced is defined as being an amino acid other than glutamate.

The content of claims 5 and 6 would meet the requirements of Rule 6 PCT.